

#15

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

GEORGE C. CLEVELAND / SPACE
FLIGHT CENTER

SATURN V

PROGRAM DIRECTIVE

SATURN V PROGRAM DIRECTIVE NUMBER: 15 ORIGINAL ISSUE DATE: OCT 26 1965
 REVISION NUMBER: _____
 SUBJECT: Saturn V Specification Program

1.0 PURPOSE

The purpose of this directive is to establish the minimum requirements, direction, and uniform management policy for the development and implementation of a Saturn V Specification Program. Specifications required herein shall be used as the basis for contracting and for configuration management.

2.0 SCOPE

This directive establishes the minimum requirements for specifications for the Saturn V Program level through System, Contract End Item and Critical Component levels as defined by NPC 500-1 Apollo Program Configuration Management Manual.

3.0 APPLICABILITY

This directive is applicable to all Saturn V organizations and to all other organizations concerned with the identification, preparation, review, approval, revision, and contract application of Saturn V specifications. Saturn V Project Offices are responsible for the compliance of their contractors with the plan as stated herein.

4.0 SPECIFICATION REQUIREMENTS

4.1 Saturn V Program Specification

Two "basic" specifications corresponding to vehicles number 501 and 504 shall be prepared defining the Saturn V Program as an entity. These specifications shall define the mission and the system performance requirements of the vehicle and the vehicle support system. The Saturn V Program Specifications shall conform to the requirements of the Apollo Program Specification; shall encompass the standard requirements applicable to all contractor design and requirements for system testing; and shall

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include by reference the applicable interface control documentation matrixes. Launch Vehicle GSE requirements shall be specified only in general terms.

Addendum specification to the 501 basic specification shall be prepared for the Facility Checkout Vehicle, the Dynamic Test Vehicle, and for flight vehicles 502 and 503 to define unique requirements for these vehicles. Addendum specifications to the 504 basic specification shall be prepared to define unique requirements for flight vehicles subsequent to 504.

The specifications and addenda shall be prepared in accordance with NPC 500-1, Exhibit I.

The Saturn V Systems Engineering Office is responsible for preparation of these specifications and all required addendum specifications. The Saturn V Program Specifications and all addendum specifications shall be approved by the Saturn V Program Manager. Concurrence shall be obtained from the Director of Research and Development Operations to certify technical adequacy of the specification, and also concurrence shall be obtained from the Saturn V Program Configuration Management Branch to certify the adequacy of the specification with respect to Configuration Management.

4.2 Stage CEI Specifications

A "basic" Part I and Part II Contract End Item (CEI) specification shall be prepared for each 501 flight stage and the 501 Flight Instrument Unit. These specifications shall describe the CEI as an entity without reference to the overall vehicle requirements or the supporting GSE requirements. These specifications shall conform to the requirements of the Saturn V Program specification and shall reference the applicable interface control documentation matrixes. The specifications shall be prepared in two parts in accordance with NPC 500-1, Exhibit II. Addendum specifications shall be prepared for the Facility Checkout stages, the Dynamic Test stages, and for flight stages which may be so similar to the basic specification that design may be covered on an "add", "delete", or "the same as except" basis. These specifications shall be prepared in accordance with NPC 500-1, Exhibit II, Format "D". The basic specifications and all addendum specifications shall identify the specific unit effectivities, i.e., 501 etc., only in Section 1.0 Scope.

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The Project Offices are responsible for the preparation of all stage specifications and addenda thereto. Each stage CEI specification shall be approved by the responsible Project Manager. Concurrence shall be obtained from Research and Development Operations, the Saturn V Program Configuration Management Branch, and the Saturn V Systems Engineering Office.

4.3 Saturn V Launch Vehicle Ground Support Equipment System Specification

A Specification shall be prepared in accordance with NPC 500-1, Exhibit I for the Saturn V Launch Vehicle Ground Support Equipment System. The specification shall include the requirements for Electrical Support Equipment and Mechanical Support Equipment and shall conform to the requirements of the Saturn V Program Specification.

The Saturn V Launch Vehicle GSE Project Office is responsible for the preparation and approval of the Saturn V LVGSE System Specification. Concurrence shall be obtained from Research and Development Operations, the Saturn V Program Configuration Management Branch, and the Saturn V Systems Engineering Office.

4.4 Saturn V Launch Vehicle Ground Support Equipment Specifications (KSC)

Contract End Item specifications shall be prepared for all Launch Vehicle Ground Support Equipment that has an interface and is delivered to the Government for direct Saturn V Vehicle support at KSC. An interface at KSC is the specifically defined and located juncture or function between two or more hardware contract end items which are under the design jurisdiction of different contractors or different government agencies at Kennedy Space Center. Present contractual documents which define design and qualification test requirements may be used for the Part I specification for these items. Part II specifications shall be prepared in accordance with Exhibit 4 of NPC 500-1.

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4.5 Critical Component Specification

Critical Components are divided into two categories and are individually specified as Engineering Critical Components and Logistics Critical Components.

a. Engineering Critical Components

Engineering Critical Components shall be considered as the highest level assemblies within a CEI that will be completely qualification tested as separate assemblies.

Engineering Critical Component Specifications shall be prepared in accordance with NPC 500-1, Exhibit VI and the referenced portions of Exhibit II, as applicable. Present Procurement specifications may be used, when determined, by the appropriate Project Manager to meet the intent of NPC 500-1.

b. Logistic Critical Components

Logistic Critical Components shall be considered as those items of equipment for which spares must be maintained to prevent delay in vehicle launch caused by component failure, or are selected for multiple source procurement.

If required for the logistics program, part II Logistics Critical Component specifications for logistic critical components not covered by Engineering Critical Component specifications or CEI specifications shall be prepared in accordance with NPC 500-1, Exhibit VI and the referenced portions of Exhibit II, as applicable.

Each Project Office is responsible for the preparation and approval of Critical Component specifications within the CEI's under its jurisdiction. Concurrence shall be obtained from Research and Development Operations, the Saturn V Program Configuration Management Branch, and the Saturn V Systems Engineering Office.

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4.6 Government-Furnished Equipment CEI Specifications

Specifications shall be prepared for all prime equipment, identification items, and critical components which are developed by MSFC for which either the designs or the hardware items are government furnished to a prime contractor for incorporation into or for direct support of his CEI's. These specifications shall be prepared in accordance with NPC 500-1, Exhibit II, IV, and V, as applicable. This category includes items under development by the Research and Development Operations, such as telemetry systems and component items. The Saturn V Systems Engineering Office is responsible for identification and preparation of these specifications. Concurrency shall be obtained from the Project Office responsible for furnishing the hardware items or designs to their prime contractors, Research and Development Operations, and the Saturn V Program Configuration Management Branch.

4.7 Requirement Item Specifications

One Requirement Item specification shall be prepared in accordance with NPC 500-1, Exhibit V, for each contract that requires Government-furnished items not requiring development.

Each Project Office is responsible for preparation and approval of Requirement Item specifications or existing contractor GFE documents which satisfy the intent of NPC 500-1, Exhibit V for each of their contracts. Concurrency shall be obtained from Research and Development Operations.

4.8 Specification Addenda

A "basic" specification shall be prepared to define the common requirements for all similar units to which a specification applies. Contract end item and critical component specifications for stages or for GSE directly related to vehicles or stages, shall cover all the requirements corresponding to vehicle 501 in the basic.

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specification. The specific effectivities to which the basic specification applies, such as "501 through 510" shall be listed only in the "Scope" of the specification. Differences in requirements applying only to particular vehicle effectivities having basically similar requirements, particular ground systems, or GSE shall be covered by separate addendum specifications prepared in accordance with NPC 500-1, Exhibit II. Addendum specifications or complete new specifications for similar units shall identify the specific unit effectivities to which they apply, only in the "Scope" of the specification.

4.9 Configuration Used By More Than One Project Office

Configurations which are developed or originally procured under the purview of one Project Office which are also required for use in another assembly or system under the purview of another Project Office, shall be governed by one basic specification. Addenda shall be prepared covering variations for additional units of the same basic design. The Project Office in which the item was developed or originally procured shall normally be responsible for the preparation of the basic specification regardless of which another unit of the same CEI series is used. Project Offices that also require the item shall be responsible for preparation of their respective addenda to the basic specification. Each Project Office preparing addenda shall obtain concurrence of their addenda from the Project Office which prepared the original specification. The Saturn V Systems Engineering Office shall be responsible for identification of all configurations having applications under more than one Project Office.

5.0 SPECIFICATION CONTROL DATA

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5.1 Saturn V Specification Tree

A Saturn V Specification Tree shall be prepared and maintained by the Saturn V Program Configuration Management Branch. The tree shall pictorially represent the tiers of specifications. The specifications shown shall be those listed in the Saturn V Specification Index. Each Project Manager shall support the Saturn V Program Configuration Management Branch as required to prepare and maintain the specification tree.

5.2 Saturn V Specification Index

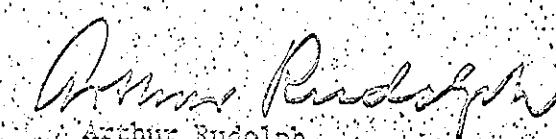
A Saturn V Specification Index, which reflects the official specification program at any point in time, shall be prepared and maintained by the Saturn V Program Configuration Management Branch. This index shall be organized by individual volumes and sections as appropriate to subdivide the specification listings by CCB responsibility, and other appropriate subdivisions. Each Project Office and Research and Development Operations is responsible for the prompt submittal of required information to the Saturn V Program Configuration Management Branch and for coordination of changes to those specifications listed in the Saturn V Specification Index.

5.3 Specification Status Reporting and Tree Maintenance

Specification program data shall be reported to the Saturn V Program Configuration Management Branch for consolidation into overall specification tree, specification index, and specification status reports. The status of specification changes shall be reported by the responsible Project Managers on appropriate forms to be supplied by the Saturn V Program Configuration Management Branch. Frequency of reporting shall be monthly, and more often for working reports which require frequent updating. Frequency of reporting shall be established by the Saturn V Program Configuration Management Branch for those reports needed more often than monthly.

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After the effective date of this directive, all CEI's required for the Saturn V vehicle or for direct vehicle support at KSC which are procured with Saturn V funds shall have complete specifications prepared in strict accordance with NPG 500-1 except for specific deviations approved by the Saturn V Program Manager.



Arthur Rudolph
Manager, Saturn V Program

Distribution:

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6.0 DEVIATIONS

Exceptions to the requirements of this Directive shall be approved by the Saturn V Program Configuration Management Branch, concurred in by the Saturn V Systems Engineering Office and will be subject to general management review by the Saturn V Program Manager.

For prime equipment, identification, or critical component items, excepting stages, which are in advanced stages of development (i.e., beyond FACI or delivery to MSFC) the intent of NPC 500-1, Exhibits II, IV, or VI may be accomplished without detailed emphasis on format. Existing documentation covering the same subject areas may be referenced provided that equivalent configuration management control is obtained by this means instead of strict conformance to NPC 500-1. Where such equivalent documentation is proposed, the deviations shall be specifically approved by the Saturn V Program Configuration Management Branch and concurred in by the Saturn V Systems Engineering Office.

7.0 IMPLEMENTATION

Each office responsible for preparing specifications shall submit a schedule for implementation of this directive to the Saturn V Program Configuration Management Branch within 3 weeks after the issue date of this directive. This schedule shall include the following milestones for each required Saturn V Specification:

1. The preparing agency submittal date to MSFC for the complete proposed specification.
2. The MSFC approval date.
3. The date the specification will be put on contract under formal change control in accordance with NPC 500-1, Exhibit VII.